



Volume 14, Issue 11

November 2009

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President's Report: John Rombi

Presidents Report

Welcome to the November edition of *Prime Focus*.

We have reached the end of The International Year of Astronomy!! Well almost.

I have a lot of people to thank for the great successes of this year, firstly Roger Powell. He has been a great support to me, helping to navigate the difficulties that such a busy year can bring.

The rest of the committee including our Webmaster Chris and PF editor Geoff have worked tirelessly to achieve these successes.

And of course there's you, the members. Public Observing Nights, School Outreach etc, all of these events cannot be as successful as they are without your enthusiasm and dedication.

The most recent compliment given to me (about MAS) was from a long time member (15 years) of another prominent Sydney Club. He said that he felt more at home, learned more and made more friends (at a recent MAS outing) in one evening, than in all the previous years at the other club!!

What we have at MAS is the true essence of what a club should be: friendship, a willingness to share, a passion for our hobby and true feeling of family.

I would also like to thank UWS, through its Provost Prof Ann Cusick, she has cut through the red tape to allow MAS to hold the observing nights this year, and she is also a great supporter of our society.

I would also like to thank Dr Ragbir Bhatl, our patron and Director of The Campbelltown Rotary Observatory, for his continued support.

(Continued on page 2)

MAS Committee

President

John Rombi

Vice President

Trevor Rhodes

Secretary

Roger Powell

Treasurer

Tony Law

Merchandising Officer

Stewart Grainger

Webmaster

Chris Malikoff

Committee Members

Lloyd Wright

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Patrons

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Observing Dates

November

14/11/09 The Forest
 16/11/09 General Meeting
 21/11/09 Stargard
 28/11/09 Public Night

January 2010

09/1/10 Stargard
 16/1/10 The Forest
 18/1/10 General Meeting

December

12/12/09 Stargard
 19/12/09 The Forest

February 2010

06/02/10 Stargard
 13/02/10 The Forest
 15/02/10 General Meeting



President's Report:

John Rombi

Ragbir has (along with Mark Johnston) manned the University telescopes for the Open Nights.

Last Month

I would like to thank Chris Malikoff (our webmaster) and astroimager extraordinaire, for bringing us part 2 of "Imaging with a DSLR". Imaging can be a daunting effort, with all the computer hardware & software needed. Chris was able to calm the prospective astroimagers in the audience with a very concise, but easy to understand entry point into this very spectacular area of Astronomy. Well Done!

Patron

MAS have been privileged to have world-renowned Australian Astronomer, Prof Bryan Gaensler as our speaker on a number of occasions over the past two years. Bryan has paid great compliments to MAS on its personal approach and presentation. The greatest compliment was to you the members, a very challenging and friendly group.

After discussions within the committee we decided to formally invite Bryan to take up the position of Patron with MAS. Just this week I have received a reply from Bryan,

"Hi John,

Thank you to you and the MAS for your generous invitation to become co-patron of your society. I plan to accept, but have only been in the office for about 3 hours in the last 3 weeks, and haven't yet had the chance to write a formal written response!

*Cheers
Bryan"*

Due to Bryan's busy schedule, we will not be able to welcome him personally until the second half of next year. There is a brief profile of Bryan on page 11.

Public Nights

We've just completed our eighth public night of this year (October 24th). Approximately 50 members of the public turned up to a clear sky!! This was very unusual as the weather had been terrible all week, and even up until lunchtime it was raining!! The clouds stayed away until 9.30pm, when a clear sky turned to heavy overcast. For once, it went our way!! As usual, the standard of presentation by all the astronomers was second to none.

Our next public night

This will be held on Saturday November 28th and due to daylight saving, sunset is not until 7.30pm.

This will mean that setup is not necessary until 6.15pm at the earliest.

As before we need as many telescopes on the field as possible.

Members private Observing Nights

Have unfortunately been hit again by the dreaded cloud. Better luck next time!!

Observing sessions will continue as normal over the Christmas/ New Year break. I will be compiling the dates very soon.

Facebook

Our Webmaster Chris Malikoff introduced another great innovation recently.

MAS is on Facebook!!

With the approx 300 million visitors to Facebook, it was an inevitable move for MAS.

This site will help with rudimentary information about us, and direct people to the MAS website.

Well-done Chris!!

Next Year

After initial discussions with Campbelltown Council a couple of weeks ago, it seems we will have access to the Art Gallery for an event of our choosing.

This will hopefully be held in the early part of 2010.

More info, when it's available.

What's on?

Keep an eye on our "What's on" link of our website for all the latest member information.

Tonight

Dr Tim Robshaw (Syd Uni) will be presenting "Magnetic Fields Near and Far"

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Since this is the last Prime Focus of 2009, on behalf of my family, I would like to wish you all a very Holy & Merry Christmas and a Prosperous 2010!!

Until next year,

Clear Skies, John Rombi



Secretary's Column:

Roger Powell

Last month I wrote about the controversial invitation by Campbelltown Library of an astroLoGer to 'celebrate the International Year of Astronomy' (which they acknowledged as a goof). Since then we have been in contact with the Mayor of Campbelltown (Cr. Rule), who apologised to MAS (although the event did still go ahead). The Mayor offered our Society the full backing of Council's resources to hold a big event sometime in 2010, which MAS has accepted. The committee is in the early stages of planning this and John will tell you more about it, as details become available. So an issue that caused a lot of comment and criticism from our members has ended on a happy note and due credit to Cr. Rule for that.

Whilst on the subject of Campbelltown Council, Cr. Bourke made local news recently with a call for Council to tighten up on light pollution measures. She has our support in this, so let's hope Council can slow the relentless light pollution tide. Recent moves to give the night sky a heritage listing may also help reduce this astronomical scourge that is enveloping Macarthur.

Our Treasurer and Membership Officer, Tony Law, recently reported that membership of the Society has grown to 88. Looking back to only twelve months ago, when we had just 66 members, that represents a 33% surge. I am fairly certain 88 is the highest membership the Society has ever had.

So now is the time to consolidate and make sure all new members are welcomed and given all the advice they need to progress as amateur astronomers. A main aim of our Society is to encourage each other with our interest in astronomy and for those who are starting out, I urge you to come along to our meetings and observing nights and don't be afraid to ask as many questions as you like. I hope some of our new members are beginning to think about buying themselves observing instruments - if so, it is very important for you to tap into the knowledge of more experienced members before you do.

Now for a regular reminder that all members should be aware of the legal requirements for purchasing, owning and using hand-held laser pointers. These nifty devices can be a boon for telescope collimation and star align-

ment, as well as for manually pointing out particular sky objects.

However, they are classed by NSW Police as 'dangerous implements' with legal procedures to be followed by astronomers who wish to purchase or import one and severe penalties if you don't comply. It looks complex and it can be, so make sure you check out our Laser Pointer page on the web site and if in doubt – ask. Don't forget, once you own a laser pointer, you should register it with the Society. This is voluntary but may save you from problems later. Make sure you have looked at the Laser Pointer page on the Macastro web-site – it's been updated.

The general meeting on 16th November will be the last for the year, so make sure you come along and hear guest speaker Tim Robishaw (Sydney University) talking about his research work on cosmological magnetic fields, which will no doubt build on the fascinating material that Professor Bryan Gaensler has shown us in his last two talks.

There will be no meeting in December, so the next general meeting will be on Monday 18th January and the next Prime Focus magazine will be in January as well.

We have a new membership form, designed by Chris Malikoff, which is available on line, so if you have any of the old forms please dispose of them and download the new one. The new form is interactive, which means it can be filled out online and e-mailed direct to us; or it can be downloaded and printed.

Another great innovation from Chris is the shiny new 'Macarthur Astronomical Society' group Facebook page, which is intended to attract attention to our Society from a wider audience and permit non-members to interact with us and will also direct them to our website.

Finally, don't forget your MAS merchandise: Shirts, caps, beanies, mugs, sew on badges, star-wheels and Astronomy 2010 – all at a discounted price for MAS members. See Stewart Grainger, who has asked to be contacted before the meeting if you know what you want to buy. Our range of products is becoming more diverse, so he may not be able to carry everything.

A Less Brief Note from the editor: Geoff Young

The end of 2009 is almost upon us. I would like to wish all members, their families and close friends a Merry Christmas and all the best for the new year.

Thankyou for your tolerance and patience during my tenure as editor of Prime Focus in 2009. I have made a number of mistakes (which the same 2 members always

pick up and comment on), but the majority of you have been very understanding as I have bumbled my way through my first calendar year.

Please note the calendar entries on page 1 for the remainder of 2009 and the beginning of 2010, and put them into your diaries.



OBSERVING NOVEMBER 2009

Sun, Moon and Planets Observing List, evening of 2009 Nov 14					
at The Forest, Belanglo, NSW					
Sunset 19:45, Twilight ends 21:18, Twilight begins 04:09, Moon rise 04:10					
Completely dark from 21:18 to 04:09. New Moon. All times local (GMT+11).					
Primary ID	Con	Mag	Rise	Transit	Set
Jupiter	Cap	-2.4	11:55	18:51	1:44
Neptune	Cap	7.9	12:23	19:09	1:56
Uranus	Aqr	5.8	14:43	20:59	3:15
Mars	Cnc	0.2	1:13	6:26	11:39

And	Andromeda	Lac	Lacerta	Cir	Circinus	Pup	Puppis
Ant	Antlia	Leo	Leo	Col	Columba	Pyx	Pyxis
Aps	Apus	LMi	Leo Minor	Com	Coma Berenices	Ret	Reticulum
Aqr	Aquarius	Lep	Lepus	CrA	Corona Austrina	Sge	Sagitta
Aql	Aquila	Lib	Libra	CrB	Corona Borealis	Sgr	Sagittarius
Ara	Ara	Lup	Lupus	CrV	Corvus	Sco	Scorpius
Ari	Aries	Lyn	Lynx	CrT	Crater	Scl	Sculptor
Aur	Auriga	Lyr	Lyra	Cru	Crux	Sct	Scutum
Boo	Boötes	Men	Mensa	Cyg	Cygnus	Ser	Serpens
Cae	Caelum	Mic	Microscopium	Del	Delphinus	Sex	Sextans
Cam	Camelopardalis	Mon	Monoceros	Dor	Dorado	Tau	Taurus
Cnc	Cancer	Mus	Musca	Dra	Draco	Tel	Telescopium
CVn	Canes Venatici	Nor	Norma	Egu	Equuleus	Tri	Triangulum
CMa	Canis Major	Oph	Ophiuchus	Eri	Eridanus	TrA	Triangulum Australe
CMi	Canis Minor	Ori	Orion	For	Fornax	Tuc	Tucana
Cap	Capricornus	Pav	Pavo	Gem	Gemini	UMa	Ursa Major
Car	Carina	Peg	Pegasus	Gru	Grus	UMi	Ursa Minor
Cas	Cassiopeia	Per	Perseus	Her	Hercules	Vel	Vela
Cen	Centaurus	Phe	Phoenix	Hor	Horologium	Vir	Virgo
Cep	Cepheus	Pic	Pictor	Hy	Hydra	Vol	Volans
Cet	Cetus	Psc	Pisces	Hyr	Hydrus	Vul	Vulpecula
Cha	Chamaeleon	PsA	Piscis Austrinus	Ind	Indus		

Best and Brightest 200 Observing List, evening of 2009 Nov 14 at The Forest, Belanglo, NSW										
Sunset 19:45, Twilight ends 21:18, Twilight begins 04:09, Sunrise 05:41, Moon rise 04:10, Moon set 17:15										
Completely dark from 21:18 to 04:09. New Moon. All times local (GMT+11).										
Listing All Classes visible above the perfect horizon and in twilight or moonlight after 20:58 and before 03:30.										
The minimum visual difficulty is: detectable.										
Cls	Primary ID	Alternate ID	Con	Mag	Size	Distance	Rise	Transit	Set	Difficulty
Open	NGC 6025	Collinder 296	TrA	6	14.0'	2500 ly	-	13:30	-	easy
Open	NGC 6067	Collinder 298	Nor	6.5	14.0'	4600 ly	-	13:40	-	easy
Glob	NGC 6101		Aps	9.2	5.0'	68000 ly	-	13:53	-	detectable
Open	NGC 6167	Harvard 11	Nor	6.6	7.0'	3600 ly	4:00	14:01	23:58	easy
Open	NGC 6178	Collinder 308	Sco	7.2	5.0'	3300 ly	4:45	14:02	23:15	easy
Open	NGC 6193	Collinder 310	Ara	5.4	14.0'	3800 ly	4:19	14:08	23:52	easy
Glob	M 62	NGC 6266	Oph	6.4	15.0'	26000 ly	6:41	14:27	22:10	detectable
Open	NGC 6322	Collinder 326	Sco	6.5	5.0'	3200 ly	5:50	14:45	23:36	obvious
Glob	NGC 6362		Ara	8.1	15.0'	23000 ly	-	14:58	-	detectable
Open	NGC 6383	Collinder 335	Sco	5.4	20.0'	3200 ly	7:04	15:01	22:54	easy
Glob	NGC 6388		Sco	6.8	10.4'	42000 ly	5:54	15:02	0:07	easy
Open	Butterfly Cluster	M 6	Sco	4.6	20.0'	1600 ly	7:11	15:06	22:58	obvious
Glob	NGC 6397		Ara	5.3	31.0'	6500 ly	3:38	15:07	2:32	easy
Open	M 7	NGC 6475	Sco	3.3	80.0'	980 ly	7:13	15:20	23:23	easy
Open	M 23	NGC 6494	Sgr	5.9	29.0'	2000 ly	8:18	15:23	22:25	detectable
Open	M 20	NGC 6514	Sgr	5.2	28.0'	2700 ly	8:10	15:29	22:44	easy
Neb	Lagoon Nebula	M 8	Sgr	5	17.0'x 15.0'	4100 ly	8:06	15:30	22:50	easy
Open	M 21	NGC 6531	Sgr	7.2	14.0'	3900 ly	8:13	15:30	22:43	detectable
Glob	NGC 6541		CrA	6.3	15.0'	13000 ly	6:33	15:34	0:31	easy
PNe	Blue Racquetball	NGC 6572	Oph	8	15"	3500 ly	9:47	15:38	21:25	easy
Open	Star Queen	M 16	Ser	6.5	6.0'	5700 ly	8:55	15:45	22:30	easy
Open	M 18	NGC 6613	Sgr	7.5	5.0'	4200 ly	8:46	15:46	22:41	easy
Glob	M 28	NGC 6626	Sgr	6.9	13.8'	16000 ly	8:25	15:50	23:12	detectable
Open	NGC 6633	Collinder 380	Oph	5.6	20.0'	1200 ly	10:01	15:53	21:41	detectable
Open	M 25	IC 4725	Sgr	6.2	29.0'	2000 ly	8:52	15:58	23:00	detectable
Glob	M 22	NGC 6656	Sgr	5.2	32.0'	9800 ly	8:40	16:02	23:20	easy
Open	IC 4756	Collinder 386	Ser	5.4	39.0'	1600 ly	10:10	16:05	21:56	detectable
Glob	M 70	NGC 6681	Sgr	7.8	8.0'	65000 ly	8:14	16:09	0:01	detectable
Open	Wild Duck Cluster	M 11	Sct	6.1	32.0'	6100 ly	9:49	16:17	22:40	detectable



OBSERVING NOVEMBER 2009

Best and Brightest 200 Observing List, evening of 2009 Nov 14 at The Forest, Belanglo, NSW										
Sunset 19:45, Twilight ends 21:18, Twilight begins 04:09, Sunrise 05:41, Moon rise 04:10, Moon set 17:15										
Completely dark from 21:18 to 04:09. New Moon. All times local (GMT+11).										
Listing All Classes visible above the perfect horizon and in twilight or moonlight after 20:58 and before 03:30.										
The minimum visual difficulty is: detectable.										
Cls	Primary ID	Alternate ID	Con	Mag	Size	Distance	Rise	Transit	Set	Difficulty
Open	NGC 6716	Collinder 393	Sgr	7.5	10.0'	2600 ly	9:12	16:20	23:25	easy
Glob	M 54	NGC 6715	Sgr	7.7	12.0'	55000 ly	8:33	16:21	0:04	detectable
Glob	NGC 6723		Sgr	6.8	13.0'	33000 ly	8:09	16:25	0:38	easy
Glob	Pavo Globular	NGC 6752	Pav	5.3	29.0'	20000 ly	-	16:37	-	easy
Glob	M 55	NGC 6809	Sgr	6.3	19.0'	20000 ly	9:16	17:06	0:51	easy
PNe	Little Gem	NGC 6818	Sgr	10	22"	7300 ly	10:19	17:10	23:56	obvious
Glob	M 71	NGC 6838	Sge	8.4	4.0'	16000 ly	12:06	17:19	22:32	detectable
PNe	Dumbbell	M 27	Vul	7.3	8.0'	1100 ly	12:25	17:25	22:25	detectable
PNe	Saturn Nebula	NGC 7009	Agr	8.3	28"	3200 ly	11:48	18:30	1:08	obvious
Glob	M 15	NGC 7078	Peg	6.3	18.0'	42000 ly	13:23	18:55	0:28	easy
Glob	M 2	NGC 7089	Agr	6.6	16.0'	49000 ly	12:50	18:59	1:07	easy
Glob	M 30	NGC 7099	Cap	6.9	12.0'	39000 ly	11:46	19:06	2:21	easy
PNe	Helix	NGC 7293	Agr	6.3	16.0'	530 ly	12:47	19:55	3:02	easy
Gal	NGC 55	MCG -7-1-13	Scl	8.5	30.2'x 3.4'	4.9 Mly	13:14	21:40	6:07	easy
Glob	47 Tucanae	NGC 104	Tuc	4	50.0'	20000 ly	-	21:49	-	obvious
Gal	M 32	NGC 221	And	8.9	8.5'x 5.9'	2.6 Mly	18:23	22:08	1:52	detectable
Gal	Andromeda Galaxy	M 31	And	4.3	2.6°x 1.1°	2.6 Mly	18:25	22:08	1:50	easy
Gal	Sculptor Galaxy	NGC 253	Scl	7.9	28.2'x 5.5'	13.0 Mly	14:49	22:12	5:35	easy
Gal	Small Magellanic Cloud	NGC 292	Tuc	2.8	5.3°x 3.4°	200000 ly	-	22:17	-	easy
Glob	NGC 288		Scl	8.1	13.0'	39000 ly	14:50	22:18	5:45	detectable
Glob	NGC 362		Tuc	6.8	14.0'	39000 ly	-	22:28	-	easy
Gal	Pinwheel Galaxy	M 33	Tri	6.4	61.7'x 36.3'	2.9 Mly	18:27	22:59	3:31	detectable
Open	M 34	NGC 1039	Per	5.8	35.0'	1600 ly	20:33	0:07	3:40	detectable
Gal	M 77	NGC 1068	Cet	9.7	6.6'x 5.8'	70.0 Mly	18:01	0:07	6:13	easy
Open	NGC 1342	Collinder 40	Per	7.2	15.0'	2200 ly	20:53	0:56	4:59	detectable
Open	Pleiades	M 45	Tau	1.5	120.0'	490 ly	20:16	1:11	6:07	obvious
Open	NGC 1444	Collinder 43	Per	6.4	4.0'	3900 ly	23:07	1:14	3:21	easy
Open	Hyades	Collinder 50	Tau	0.8	5.5°	150 ly	20:30	1:51	7:13	obvious
Open	NGC 1647	Collinder 54	Tau	6.2	40.0'	1800 ly	20:58	2:10	7:22	detectable
Open	NGC 1664	Collinder 56	Aur	7.2	9.0'	3900 ly	22:47	2:15	5:43	easy
Open	NGC 1746	Collinder 57	Tau	6.1	42.0'	1400 ly	21:31	2:28	7:25	detectable
Glob	NGC 1851		Col	7.1	12.0'	55000 ly	18:06	2:38	11:10	easy
Gal	Large Magellanic Cloud	ESO 56 115	Dor	0.8	10.8°x 9.2°	200000 ly	-	2:47	-	obvious
Open	M 38	NGC 1912	Aur	6.8	20.0'	3500 ly	22:43	2:53	7:03	detectable
Neb	Great Orion Nebula	M 42	Ori	4	40.0'x 20.0'	1350 ly	20:38	2:59	9:20	obvious
Neb	M 43	NGC 1982	Ori	9	7.0'x 6.0'	1600 ly	20:39	3:00	9:20	detectable
Open	M 36	NGC 1960	Aur	6.5	10.0'	4300 ly	22:43	3:00	7:18	easy
Neb	Tarantula Nebula	NGC 2070	Dor	8.3	5.0'	185000 kly	-	3:02	-	obvious
Neb	M 78	NGC 2068	Ori	8	8.0'	1600 ly	21:05	3:11	9:17	detectable
Open	M 37	NGC 2099	Aur	6.2	14.0'	4500 ly	22:52	3:16	7:41	easy
Open	NGC 2129	Collinder 77	Gem	7	5.0'	4900 ly	22:27	3:25	8:24	obvious
Open	37 Cluster	NGC 2169	Ori	7	5.0'	3400 ly	22:05	3:32	9:00	obvious
Open	M 35	NGC 2168	Gem	5.6	25.0'	3000 ly	22:38	3:33	8:28	easy
Open	NGC 2175	Collinder 84	Ori	6.8	22.0'	5300 ly	22:26	3:34	8:41	easy
Open	NGC 2264	Collinder 112	Mon	4.1	39.0'	2200 ly	22:26	4:05	9:44	obvious
Open	M 41	NGC 2287	CMA	5	39.0'	2300 ly	21:02	4:10	11:17	easy
Open	NGC 2301	Collinder 119	Mon	6.3	14.0'	2800 ly	22:11	4:16	10:21	obvious
Open	M 50	NGC 2323	Mon	7.2	14.0'	3300 ly	21:57	4:26	10:56	easy
Open	NGC 2353	Collinder 130	Mon	5.2	18.0'	3600 ly	22:03	4:38	11:13	obvious
Open	NGC 2355	Collinder 133	Gem	9.7	7.0'	7200 ly	23:13	4:41	10:09	detectable
Open	NGC 2360	Collinder 134	CMA	9.1	13.0'	6200 ly	21:50	4:41	11:32	detectable
PNe	Eskimo Nebula	NGC 2392	Gem	8.6	47"	3400 ly	23:47	4:53	9:59	obvious
Open	M 47	NGC 2422	Pup	4.3	25.0'	1600 ly	22:13	5:00	11:48	obvious
Open	NGC 2423	Collinder 153	Pup	7	12.0'	2500 ly	22:15	5:01	11:46	easy
Open	NGC 2439	Collinder 158	Pup	7.1	9.0'	13000 ly	21:15	5:04	12:57	easy
Open	M 46	NGC 2437	Pup	6.6	20.0'	4500 ly	22:17	5:05	11:54	easy
PNe	NGC 2440	PN G234.8+02.4	Pup	12	54"	3700 ly	22:06	5:06	12:09	detectable
Open	M 93	NGC 2447	Pup	6.5	10.0'	3400 ly	21:50	5:08	12:30	obvious
Open	NGC 2451	Collinder 161	Pup	3.7	45.0'	720 ly	20:49	5:09	13:33	obvious
Open	NGC 2477	Collinder 165	Pup	5.7	15.0'	4000 ly	20:53	5:16	13:43	obvious
Open	NGC 2516	Collinder 172	Car	3.3	30.0'	1300 ly	-	5:21	-	obvious
Open	NGC 2506	Collinder 170	Mon	8.9	12.0'	11000 ly	22:47	5:24	12:04	detectable
Open	NGC 2547	Collinder 177	Vel	5	25.0'	1500 ly	19:44	5:34	15:27	obvious
Open	NGC 2546	Collinder 178	Pup	5.2	70.0'	3000 ly	21:18	5:36	13:57	easy
Open	NGC 2571	Collinder 181	Pup	7.4	8.0'	4400 ly	22:02	5:42	13:27	easy
Open	IC 2391	Collinder 191	Vel	2.6	60.0'	570 ly	19:04	6:04	17:08	obvious
Open	Beehive	M 44	Cnc	3.9	70.0'	610 ly	0:54	6:04	11:14	easy
Open	IC 2395	Collinder 192	Vel	4.6	18.6'	2600 ly	20:29	6:06	15:47	obvious

These lists were produced using SkyTools v3. If members have any changes they would like made, please let me know at editor@macastro.org.au



Star Hopping to the Messiers #18 - Perseus M34 & M76: Bob Bee

Perseus, popping up as it does above our low northern horizon for 3 hours maximum, is best seen from our latitude in December around 10pm (Eastern Summer Time), though it is equally visible around midnight in November. Plan your viewing time well or you'll miss it. Obviously you'll have a better chance viewing these from more northern climes. Try Darwin.

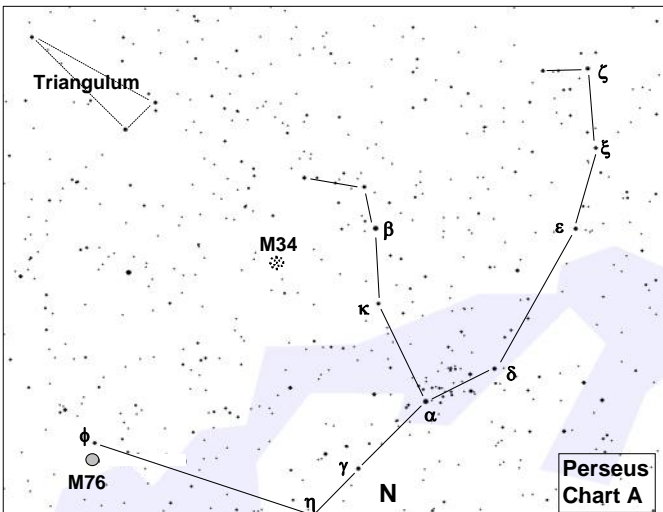
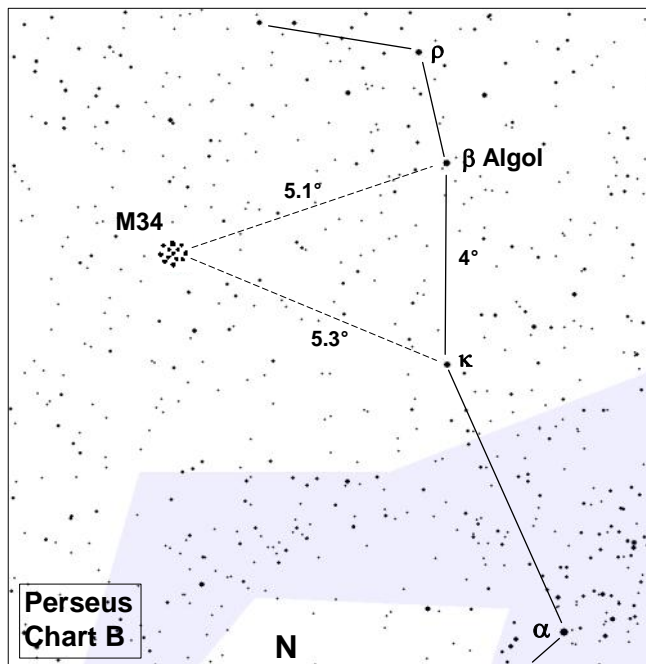
Perseus is not one of our better recognised constellations as we see it so fleetingly, if at all. It is famous for a few things. Algol (or b Persei) is the famous Demon star, being the prototype of the celebrated Algol eclipsing binary star class of variables; also, the renowned Double Cluster of NGC 869 and 884. But we'll just focus on its two Messier objects.

(PN = Planetary Nebula; OC = Open Cluster.)

Messier No.	M34	M76
Type	OC	PN
Size (arc-min)	35	4.8
Magnitude	5.2	10.2

From Chart A, you can see that M34 is in the vicinity of Algol (β Per.) while M76 is closer to the horizon very near phi (ϕ) Per.

both β and κ in your f/s FoV on one side, M34 would be just outside the FoV on the opposite side. Move in that direction and it should quickly come into view, as it is definitely visible in binoculars and finder scopes. Centre your f/s on the cluster and enjoy it in your main eye piece.

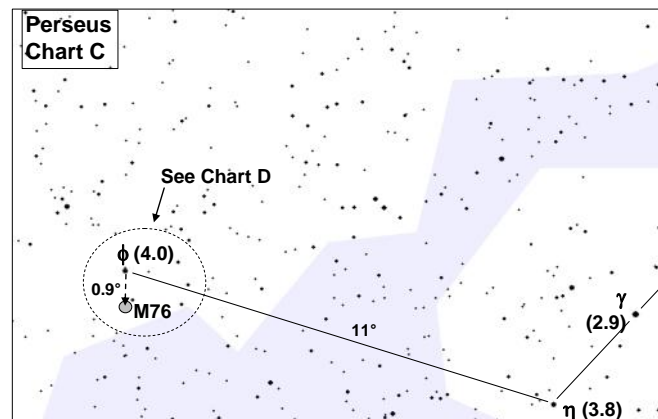


M34: We'll start with M34. First identify β Persei from the chart. It will usually be a mag. 2.1 star except, every 2.87 days, it drops to mag. 3.4 for 10 hours. That in itself is worth watching out for. Also identify κ Per. which is about 4° below β .

As you can see from Chart B below, M34 forms a very nice isosceles triangle with the stars β and κ Per., with M34 being just over 5° from both stars. So if you place

M76: Now for M76, a mag. 10 planetary nebula which will not be visible in your finder scope. You will need to centre your f/s on 'the spot' and confirm it in your main eye piece.

To do that, you need to locate the mag. 4.0 star ϕ Persei, about 11° west of η and γ Per. See Chart C below.



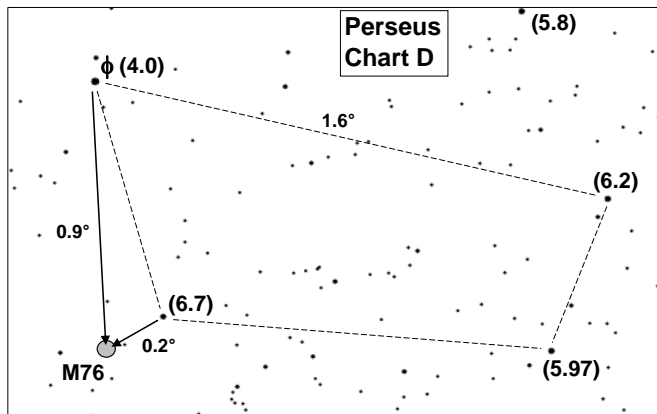
When you get ϕ Per. in your finder scope, you will notice a 1.6° long quadrilateral made up of ϕ and three mag. 6 stars (or a 5 sided polygon if you include the other 6th



Star Hopping to the Messiers #18 - Perseus M34 & M76: Bob Bee

mag. star above it).

These 4 (or 5) stars plus ϕ Per. should all fit inside your f/s FoV. See Chart D below for more detail of this arrangement you'll see in your f/s.



As shown in Chart D, M76 is located less than 1° from ϕ Per and only 0.2° ($12'$) from the closest mag. 6.7 quad star. Put the f/s centre on that spot and check in your main eye piece. You should have M76 in your FoV.



M34



M76

Good Hopping.

This article concludes my series of "Star Hopping to the Messiers". You will notice that I haven't covered the Messiers in Cassiopeia (M52 and M103) and Ursa Major (Ms 40, 81, 82, 97, 101, 108 and 109). That is because these Messiers are not visible at all from our latitude. If anyone thinks they will be travelling far north some time in the future and such an article would help them, please let me know and I can produce an article with star hopping charts for these two constellations for your use.

I hope that you have found this series helpful in your Messier Hunt quest.

The One Above Sees All:

David M Jones

Space exploration and Astrophotography have made *astrophotography* advances in recent years. The first astrophoto is attributed to John William Draper way back in 1840, and is reported as being a photograph of the moon. Draper was an English born, American scientist, philosopher, physician, chemist and, of course, photographer. In 1880, his son, Henry, would become the first to photograph a deep space object – the Orion Nebula. (Wikipedia, 2009) Today, astrophotography is recognised as being one of the fastest growing areas for amateur star-gazers and an ever-consuming race for perfection amongst professional astronomers.



John William Draper (1811-1882) Sl.org. 452,757

Since its launch on April 25, 1990 the Hubble Telescope has been one of the most fascinating, and easily the widest publicised telescope in history. Hubble continues to astound the human race with its ever revealing detailed photographs from deep space. It is generally agreed that no single telescope, neither terrestrial nor

space can provide all the answers relating to the cosmos. Hubble has, nevertheless, made a unique contribution to our present knowledge of the universe. Those who remember Hubble's beginnings might recall that all was not as it should have been when those first long awaited results filtered down from its 550 kilometre, low Earth orbit.

Recommendation for the building of a large space telescope came from the American Academy of Sciences as early as 1962. Original costing for Hubble made it a hard sell with estimates ranging up to \$500 million (US). NASA and other leading astronomers initially lobbied the US Congress in vain. Eventually, the original 3 metre mirror was reduced to 2.4 metres – thereby reducing the estimated cost by \$200 million (US). In 1977 the American Congress finally voted to fund the venture. (Okolski, 2008) It would be another eight years before construction was completed in 1985. The unforgettable 1986 Space Shuttle Challenger disaster further deferred the planned launch of Hubble.



The One Above Sees All:

David M Jones

Finally, the long awaited launch took place on 25th of April, 1990 – some twenty-eight years after the first recommendations were put forward.

Just days after the launch, Hubble was sending back its first results from space; these were disappointingly out of focus! Hubble was effectively – ‘myopic’ – the fault, as it turned out, due to an error 1/50th the width of a single human hair. This fault caused the mirror to be ‘too flat’ on one edge which in turn produced blurred images. (Stathopoulos, 2000-2009)

Engineers worked overtime to come up with an answer to the problems plaguing Hubble with the first servicing mission due in December, 1993. The answer, in layman’s terms, was a hi-tech ‘set of glasses’ constructed to correct Hubble’s sight! The system, named COSTAR – (Corrective Optics Space Telescope Axial Replacement) would prove to be a resounding success.

One can only imagine the sighs of relief once the first in-focus, sharp images were beamed down to Earth. As we all now know, Hubble has continued to outlive all expectations. Originally destined to be returned to Earth after fifteen years, even its useful working life has been extended another five years to 2010. All good things must come to an end, so what happens once Hubble is finally retired?

Apart from returning astounding photographic results, Hubble has also provided a unique testing ground for future projects of a similar nature. The next generation space telescope is already under construction. Named, the James Webb Space Telescope (JWST), it is due for launch some time in 2014; its launch site will be the Arianespace’s ELA-3 launch complex at European Spaceport located near Kourou, French Guiana. (Jonathan, 2009)



This next generation space telescope will be a large infrared telescope with a 6.5-metre primary mirror. The NASA – James Webb page describes the new telescope thus:

JWST will be the premier observatory of the next decade, serving thousands of astronomers worldwide. It will study every phase in the history of our Universe, ranging from the first luminous glows after the Big Bang, to the formation of solar systems capable of supporting life on planets like Earth, to the evolution of our own Solar System. (Jonathan, 2009)

As might be expected, many innovative technologies are being developed for inclusion aboard the JWST, including a folding, segmented primary mirror, adjusted to shape after launch; ultra-light-weight beryllium optics; detectors able to trace particularly weak signals, micro-shutters that allow programmable object selection for the spectrograph; and a cryocooler for cooling the mid-IR detectors to 7K. (Jonathan, 2009)

One might well conclude, with rapid advances in technology being what they are, even the most advanced equipment onboard the JWST will be a little out of date come launch time. The obvious conclusions can only be, the same needs as hindered Hubble – the need for maintenance and constant upgrade - will also greatly affect the JWST. Whilst costing an estimated \$2.4 billion from now to launch and a further \$1 billion for 10 years of operation, the returns must somehow justify the economic outlay for such a magnificent venture. For my part, I sincerely hope I am still around in a few years to see some of the as yet undreamed of results.

References:

- Jonathan, G. P. (2009, August 3). *The James Webb space telescope*. Retrieved October 20, 2009, from NASA: <http://www.jwst.nasa.gov/>.
- Okolski, G. (2008, April 18). *A brief history of the hubble space telescope*. Retrieved October 20, 2009, from NASA: <http://history.nasa.gov/hubble/printFriendly/index.html>.
- Stathopoulos, V. (2000-2009). *Hubble space telescope history* (Hubble Information). Retrieved October 19, 2009, from e.net: SpaceAAerospaceguide.net: SpaProjects and Info Projects and Info: <http://www.aerospaceguide.net/spacehistory/hubble-history.html>.
- StSI. (2004). *HubbleSite*. Retrieved October 20, 2009, from Space Telescope Science Institute, Baltimore USA: <http://hubblesite.org/>.
- Wikipedia, C. (2009, October 17). *Astrophotography* (Wikipedia Article on Astrophotography). Retrieved October 19, 2009, from Wikipedia: <http://en.wikipedia.org/wiki/Astrophotography>.



Robert Julius Trumpler - Star Cluster Pioneer: Bob Bee

As amateur astronomers, we are all aware of the most common catalogues of deep space objects. There's the ubiquitous Messier catalogue, the NGC and IC catalogues. You're probably aware of the Dunlop catalogue (after James Dunlop from Parramatta Observatory) and even the Collinder catalogue of open clusters. (The best known is probably Collinder 399, the Coathanger in Vulpecula). There is no shortage of catalogues; even Patrick Moore has one, the Caldwell Catalogue (after his middle name).

How many times have you looked at a star chart and come across a deep sky object with a Trumpler number? I have a few times. They are invariably open clusters, some (but not many) visible in binoculars. However, most are very small or faint or both. I often wondered who this Trumpler is (or was). If you Google his name, you will receive a deluge of information. The following is a small sampler of the key information about his life and astronomical work. It might inspire you, once you tire of Messier hunting, to hunt for the Trumpler clusters.. There aren't that many of them.

Robert Julius Trumpler was born on 2nd October, 1886 in Zurich, Switzerland and died on 10th September, 1956 at Berkeley, California. He received his early education in Switzerland, then studied in Germany where in 1910 he received his PhD. During WWI, he emigrated to USA to take up a position at the University of California. He eventually went to Lick Observatory, becoming a naturalised US citizen in 1921. In 1938 he transferred (thus returning) to the astronomical department of The University of California, Berkeley, retiring in 1951.



Trumpler established himself in the astronomical community by studying the reduction of brightness of distant globular clusters and the apparent reddening of their stars, which he was able to explain by the galaxy's interstellar dust.

In 1922, Trumpler took part in the expedition to Wallal, Australia, to observe the solar eclipse in order to test Einstein's then-new theory of General Relativity. His observations helped confirm Einstein's theory.

However, while working in the broad areas of astronomy, Trumpler's main work fell into either positional astronomy or the study of star clusters and the Milky Way. He was particularly interested in ways to classify star

clusters. His published papers on the latter subject are too many to mention here.

One of his aims in studying star clusters was to contribute to the determination of the size of our Milky Way galaxy. His early calculations were drastically undersized by a factor of about 3, suggesting that the Milky Way was a 'mere' 10,000 parsecs (32,000 light years) across, but those were early days and it was a time of confusion for all astronomers. He made up for that personal lapse (ultimately corrected) by devising his system of classifying clusters, incorporating such factors as central concentration, the number of stars in the cluster and their stars' range of brightness. This classification system is still in use.

The Trumpler Classification Scheme

Concentration

- I Detached; strong concentration toward center
- II Detached; weak concentration toward center
- III Detached; no concentration toward center
- IV Not well detached from surrounding star field

Range in Brightness

- 1 Small range in brightness
- 2 Moderate range in brightness
- 3 Large range in brightness

Richness

- p Poor: Less than 50 stars
- m Moderately rich: 50 to 100 stars
- r Rich: More than 100 stars

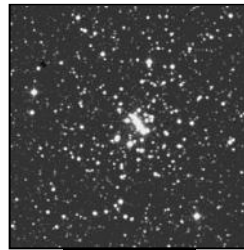
In the process of presenting a monumental paper in 1930 titled "Preliminary Results on Distances, Dimensions and Distribution of Open Star Clusters", he delivered a catalogue of 334 clusters for which he had computed distances based on their diameters. Most of them were previously known, but included 37 new clusters he had discovered. It is these 37 that form the **Trumpler Catalogue of Open Clusters**. A selection of those 37 clusters is given in the table on page 10. The reason it is incomplete is I was unable to locate information on the missing clusters. Maybe you can do some research and fill the gaps.

As you can see from the above selection, most are easily available at our latitude, except for Tr 1, 2 & 3. You will find that some of these clusters are 'buried' inside star fields or 'attached' to other well known clusters, such as the Eagle Nebula's cluster or the Eta Carina cluster, making them difficult to identify. Where does the Trumpler cluster begin and the other end?

Like many famed astronomers, Trumpler had a crater on

Robert Julius Trumpler - Star Cluster Pioneer: Bob Bee

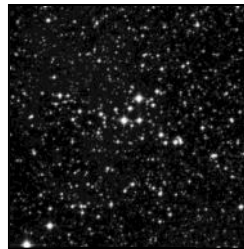
Trumpler No.	Constellation	RA (hr, m, s)	Dec. (°, ', ")	Est. Dist. in pc
1	Cassiopeia	01 35 42	+61 17 00	2,560
2	Perseus	02 37 18	+55 59 00	650
3	Cassiopeia	03 11 48	+63 15 00	?
9	Puppis	07 55 40	-25 53 00	2,290
10	Vela	08 47 54	-42 27 00	420
12	Carina	10 06 29	-60 18 00	?
15	Carina	10 44 43	-59 22 00	1,850
16	Carina	10 44 58	-59 43 00	2,670
21	Centaurus	13 32 14	-62 48 00	1,260
22	Centaurus	14 31 02	-61 10 00	1,520
26	Scorpius	17 28 33	-29 30 00	?
27	Scorpius	17 36 30	-33 31 00	1,650
31	Sagittarius	17 59 49	-28 10 00	990



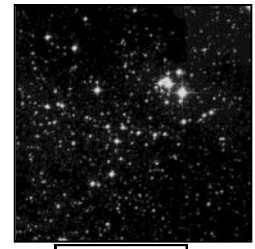
Tr1



Tr2



Tr21



Tr27

named after him on Mars in the southern part of the Martian highlands.

Above are a few images of Trumpler clusters.

the Moon named after him. Unfortunately it is on the far side so we cannot observe it. There is also a crater

Why not start hunting them down? Then you can trumpler about your success.

Doing It In The Dark:

Trevor Rhodes

Well Sports Fans, this month kicked off with a great night out at Mamre Homestead where MAS were invited to be a part of the entertainment for a fundraiser called 'The 100 Mile Dinner Under The Stars' being put on by 'The Mamre Project'. This is an initiative of the Sisters of Mercy, which arose through the work of their Youth Team in the Landcom suburb of St Clair.

I, being the self admitted techie that I am, chose to let my iPhone GPS application lead me there. Wrong move Trevor. I ended up in St Marys, instead of St Clair. Changing to Google Earth had me back on the right track and in sight of John and Roger before the sun went down thankfully. We were given a nice spot close to the festivities, food and amenities. There was a slow but constant arrival of people before the speeches in the marquis and an even faster one afterwards. I must say that this is one of the things that I love about being a part of MAS. Meeting new people and introducing them to the wonders we get to see on a more regular basis. Having one of Jupiter's moons transiting that night brought some Ooohs and Aaaahs from the guests. Food and drink were supplied which certainly kept me happy.

At the end of the night we were paid a visit by Sister Mary Louise and another Nun whose name I am unable to recall. After being thanked quite warmly by both Sisters we were invited back for next years celebrations.

On the same night, Chris and Ned were having themselves a great time down at The Forest. As they told us, the seeing was the best they'd experienced in a long time. Considering how good the night had been at St Clair, I had to believe them. If our seeing was as good as we'd experienced being so close to the city lights, I can only imagine how much better at a dark sky site an hour and a half further out. I hope those who were not in attendance at those venues had found somewhere themselves to set up and not waste such a perfect night.

Saturday rolled around and another 13 people turned up at The Forest with great expectations of another terrific night of viewing and imaging. Sorry folks, it was not to be. The clouds started to roll in and the rains came. The rain went and more clouds came in. We probably had 30 to 60 minutes of partial sky all night. One of the highlights of the night came when I found that my much loved Dobbie was not holding collimation. As I started to move the scope from the horizon the laser dot moved quite considerably. I tried this a few times but it kept happening. The next thing I know, Chris and John are operating on my scope and telling me not to watch. I felt like an expectant father waiting on the outcome. It turns out the springs used to keep the primary in place are not of sufficient strength to do the job. After a quick stretch the springs were replaced and the scope was reunited with the base. Having the person who is holding your



Doing It In The Dark:

primary mirror ask the question 'how much longer?', is not what you want or need at such a time. When the last of the screws were done back up I realised I had been holding my breath. Probably not for the whole time, but certainly long enough for my lungs to start hurting. I do love oxygen.

10 people chose to leave and go home while the other five decided to tough it out and hope for some luck later in the night. The conversation in the cabin was more illuminating than the much sought after heavenly photons. But even this hardy bunch had to concede defeat at 2am and shuffle off to get some sleep before the drive home later in the morning.

The Open Night on the 25th was quite successful to say the least. Although we weren't overrun by the public, it gave us the ability to pay more attention to those to whom we were talking. Being able to show one person or a family, two or three different objects and talk to them at greater length was much more satisfying for all

Trevor Rhodes

concerned. I even heard at least two people ask about joining. Though the clouds rolled in around 10:15 to 10:30pm, that was NOT the end of the night. After the last of the public left all the chairs came out and coffee was poured.

The topic of conversation was mostly old television shows. A few of those were: It's About Time, The Green Hornet, all the Star Treks, Batman (Robin was in the 1943 shows, so I was wrong), Superman, Lost in Space (danger Will Robinson, danger). My opinion? Way too many of us spent way too much time watching way too much television (but mum, I finished my homework). Even Robbie the Robot got a mention. The last time I looked at my watch was when we were pulling away from the domes and it was 12:15am.

I look forward to seeing you all out on the field in the near future.

Bring your coffee.

Profile of Bryan Gaensler

<http://www.physics.usyd.edu.au/about/profiles/gaensler.shtml>



Bryan Gaensler was born and raised in Sydney, and graduated from The University of Sydney in 1995 with First Class Honours in Physics. His final mark of 100%, the highest ever awarded in the Faculty of Science, saw him awarded the University Medal in Physics.

As part of his PhD research in radio astronomy, Bryan set out to understand why the remnants from exploding stars form particular patterns rather than just scatter off in random directions. He surprised the astronomical world by showing that these remnants all line up with the Galaxy's magnetic field like giant compasses.

For this and other work, Bryan received his doctorate from The University of Sydney in 1999. He then took up a prestigious Hubble Fellowship at the Massachusetts Institute of Technology (MIT) in Boston, where he became involved in X-ray studies of the Milky Way using the newly-launched Chandra X-ray Observatory. After three years at MIT, Bryan moved to the Smithsonian Institution as a Clay Fellow, and then spent several years teaching in the astronomy department at Harvard University. As an Associate Professor at Harvard, Bryan

built the world's leading research group for studying neutron stars and supernova remnants, and also coordinated the astronomy major for undergraduate students. Bryan was the 1999 Young Australian of the Year, gave the 2001 Australia Day Address to the nation, was a 2005 Alfred P. Sloan Research Fellow, and was the recipient of the 2006 Newton Lacy Pierce Prize, awarded by the American Astronomical Society "for outstanding achievement in observational astronomical research". He has authored over 150 scientific papers, and has written dozens of popular articles on science and astronomy. In recognition of his achievements, Bryan was awarded a prestigious Federation Fellowship by the Australian Research Council, which in 2006 saw him return to The University of Sydney as Professor of Physics.

Bryan and his research group at Sydney are now focusing their work on the origin of magnetism in the Universe, and on the demography of neutron stars and black holes in our Milky Way. For the period 2007-2008, Bryan also held the position of International Project Scientist for the Square Kilometre Array, a next-generation radio telescope. In addition to his research, Bryan is an avid fan of rugby league, baseball and cricket. He lives in Sydney with his wife, Laura, and son, Finn.

Your MAS AssTrollogy For November - December

By Heso Fulovit, Asstrolloger to the Astronomers

Sagittarius (12:00:00 November 29 – 11:16:43 pm Dec 22)

Pluto has entered your house this year, so it's a good time to go clean out his kennel while he's not watching. He may have been demoted, but his fleas are as itchy as ever. As your year ends, remember that a new one may soon be around the corner so control your destiny and buy a new calendar, preferably ending in 10.

Capricorn (11:16:44 pm Dec 22 – 9:28:27 pm 20 Jan)

Neptune's trident is at your disposal this month, so use it wisely. It may make you rich, but if not, it may make others around you rich. Either way, you will still have Jupiter for a spot of help to keep you out of the red. If not, maintain your contentedness knowing I'm getting rich writing this rubbish for you.

Aquarius (9:28:28 pm Jan 20 – 10:08:31 pm February 19)

Be warned, Uranus is still in your sign. It hasn't shown any movement for years. A good dose of Agerol may be of benefit. Failing that, a bit of hard work never hurt anyone. You may be pleased about the outpouring benefit. And have confidence that all your unknown fears will be resolved, though you won't know it, saving you further anxiety. Those new filters you ordered, if you ordered any, may soon arrive.

Pisces (10:08:32 pm February 19 – 11:38:07 pm March 20)

A friend you haven't seen for years may turn up this month. If not, it's his loss. Now is the time to dream of that new telescope you wanted. It never hurts to dream, just don't talk out loud as you do. If you don't get that scope for Christmas, don't fret. Keep dreaming and reflect or focus on your blessings. Always remember, as the heroic Annie said, the Sun will rise tomorrow. Probably.

Aries (11:38:08pm March 20 – 01:06:52 am April 21)

You will learn many lessons of life this month, thanks to Saturn finding its rings again. If you are in love, you may find out to whom. If you aren't, you won't. There is an excellent chance you will discover a new comet this month, if you look in the right place at the right time and remember to take the lens cap off your scope. However, if you don't, you'll know you had the chance and will be stronger for it.

Taurus (01:06:53 April 21 – 10:58:12 pm May 20)

Mars leaves you this month so it's time to look for a new

tenant, preferably one less warlike and less prone to opposition. Find one who'll bring more atmosphere into your home and insist on a larger bond. There is a chance your favourite star Aldebaran will go supernova this year. If not, it's a positive lesson in managing disappointment. It will happen one year, no bull.

Gemini (10:58:13 pm May 20 – 01:42:01 am June 22)

With Mercury backing way up into the end of Uranus, it is time to reflect on the direction in which your life going. Geminis operate on an inalterable value system, one which remains in place despite vagaries of fashion, taste or common opinion. They are a noble people sticking to their own standards of what is correct, no matter what. And if you find your primary mirror is cracked, be happy in the opportunities it offers.

Cancer (01:42:02 am June 22 – 07:28:57 pm July 23)

This is the first of the water signs, ruled by the moon. You are extremely sensitive to lunar eclipses. Because you can't help but react to your environment you just never know whether the bursts of crabbiness you are so noted for is because of something you have done, or another cloudy observing night. Resist indolence; rather be a hive of activity in your house.

Leo (07:28:24 pm July 23 – 00:59:59 am August 24)

The Sun makes its debut in the sign of Leo later this month. This is a unique phenomenon as the Sun has never, ever entered this zodiacal sign before in the last 13.7 billion years, and is a precursor to the events foretold by the Mayans for 21/12/2012. Leos are faced with two alternatives. Either send me all your earthly possessions and I will show you a special reading that will save you, or believe everything that happens in the movie 2012 will happen to you with no chance of survival.

Virgo (01:00:00 am August 24 – 11:56:13 pm September 23)

With your Sun in Virgo, your Moon in Scorpio, and most everything else in a stilliform position sitting right alongside the used-to-be-a-planet Pluto, you are a person who is tightly wrapped, compelled to control everything to perfection. The Universe treats such individuals as fair game and usually has surprises in store to upset almost anything you may want to do. Celebrate with a t-shirt saying "I'm a Virgo" and see how many offers you get.

Libra (11:56:14 pm September 23 – 10:01:58 pm October 23)

What chance really do you have? Yours is the only inanimate sign of the zodiac and pretty well reflects on you and your destiny. On the positive side, however, Librans

Your MAS AssTrollogy For November - December

By Heso Fulovit, Asstrolloger to the Astronomers

are among the most civilized of the thirteen zodiacal characters and are often good looking with elegance, charm and good taste (there – feel better now?). Those who are not tend to be intelligent and wise. On the balance, which are you? If neither, look up 'loser' in Wikipedia.

Scorpio (10:01:59 pm October 23 – 07:35:27 pm November 15)

Venus comes to stay for a few weeks and while she is in your sign your house will be more crowded than usual. Be prepared for intense feelings of disappointment while queuing for your turn in the bathroom and reflect on the advantages of purchasing more clothing. As compensation, the life-bringing Sun enters your sign in December so give yourself a present by watching it at high power without your solar filter. Just this once. It has its risks

but, hey, you're a Scorpio. Adventure is your name. And remember, audio tapes of this column are available at a reasonable price.

Ophiuchus (07:35:28 pm November 15 – 11:59:59 November 29)

Mercury is moving into your house this month, so you may quickly come into some silver. Otherwise nothing much happens under this sign as no-one has ever written enough drivel to plagiarise into what appears to be a meaningful forecast. Consider approaching the Registrar of Births in your State to have your birth date changed to a sign with a better forecast. Born only two seconds earlier and you'd be a Scorpio. Life's tough, but as an Ophiuchian, you can take your medicine.

Understanding Engineers

Understanding Engineers - One

Two engineering students were walking across a university campus when one said, "Where did you get such a great bike?"

The second engineer replied, "Well, I was walking along yesterday, minding my own business, when a beautiful woman rode up on this bike, threw it to the ground, took off all her clothes and said, "Take what you want."

The first engineer nodded approvingly and said, "Good choice; the clothes probably wouldn't have fitted you anyway."

Understanding Engineers - Two

To the optimist, the glass is half full. To the pessimist, the glass is half empty. To the engineer, the glass is twice as big as it needs to be.

Understanding Engineers - Three

Normal people believe that if it ain't broke, don't fix it. Engineers believe that if it ain't broke, it doesn't have enough features yet.

Understanding Engineers - Four

The graduate with a science degree asks, "Why does it work?"

The graduate with an engineering degree asks, "How does it work?"

The graduate with an accounting degree asks, "How much will it cost?"

The graduate with an arts degree asks, "Do you want fries with that?"

Understanding Engineers - Five

What is the difference between mechanical engineers and civil engineers?

Mechanical engineers build weapons and civil engineers build targets.

Prime Focus Article Submission

Deadline for article submissions for the next edition of Prime Focus is

Monday 11th January 2010

All Articles can be submitted via email editor@macastro.org.au

Or via snail mail to the MAS Postal address

PLEASE NOTE THE CHANGE OF EMAIL ADDRESS